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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,469	09/28/2004	Shinsuke Ide	JFE-04-1218	2226

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IP GROUP OF DLA PIPER US LLP  
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EXAMINER
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YEE, DEBORAH

ART UNIT	PAPER NUMBER
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1742

MAIL DATE	DELIVERY MODE
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09/11/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/509,469

Applicant(s)

IDE ET AL.

Examiner

Deborah Yee

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1, 4 to 10, and 12 to 19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 4 to 10, and 12 to 19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9-28-04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 4 to 10, and 12 to 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over European patent 1207214 (hereinafter EP'214), cited by applicant in IDS dated 10-19-05.

3. EP'214 in claims 1 to 17 on pages 14 and 15 discloses a metallic material having a composition with constituents whose wt% ranges overlap those recited by the claims; such overlap renders applicants' composition prima facie obvious because it would be obvious for one skilled in the art to select the claimed alloy wt% ranges over the broader disclosure the prior art since the prior art teaches same utility (fuel cell) and similar high temperature mechanical properties and oxidation resistance, see MPEP 2144.05.

4. Prior art steel Nos. 1, 3, 6 to 8 and 11 in table 1 on page 10 meet the claimed composition and Mo/Nb ratio limitation recited by the claims. Even though prior art examples do not add small amounts of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Zr or Hf as recited by the claims, such elements would be obvious to incorporate since they are taught in paragraphs [0045] and [0046] as additional alloying constituents.

5. In regard to precipitation, EP'214 table 2 on page 12 discloses steels containing Fe-Cr intermetallic compound precipitation, and paragraph [0024] teaches adding Si to

accelerate precipitation (same reason as stated on page 16, lines 13-21 of applicant's specification).

6. In regard to method of making, EP'214 in paragraph [0049-0050] discloses subjecting steel to hot rolling, annealing, pickling, cold rolling and/or annealing in the same manner as claimed by applicants. In addition, paragraph [0054] further subjects steel at 900C in air for 400 hours, which would cause precipitation; and hence be equivalent to the recited aging step (note applicant ages at 500-900C).

7. Since prior art composition and process of making are similar to present invention, then the conductivity property and the mass percentage of precipitates at 0.01% or higher or higher than 0.03% during operating use as recited by the claims would be expected in absence of proof to the contrary.

8. Moreover, paragraph [0058] discloses steel for fuel cells having high temperature resistance properties at 900C. Hence using fuel cell at operating temperature of 800C for at least 1,000 hours as recited by one or more the claims would be expected.

9. Although making fuel cell by subjecting metallic material to cutting, corrugating, etching as recited by claims 15 to 17 are not taught by prior art, such would not be a patentable difference since said process steps are conventional and well known in the art in producing fuel cells, and therefore would be implicit in making prior art fuel cell.

10. Claims 1, 4 to 10, and 12 to 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,641,780 (Grubb).

11. US '780 in claims 1 to 10 of columns 21-22 discloses a metallic material having a composition with constituents whose wt% ranges overlap or closely approximates those

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recited by the claims; such overlap renders applicants' composition prima facie obvious because it would be obvious for one skilled in the art to select the claimed alloy wt% ranges over the broader disclosure the prior art since the prior art teaches the same utility (fuel cell) and similar high temperature mechanical properties and oxidation resistance, see MPEP 2144.05.

12. More specifically, Grubb discloses steel examples in Table 1 of column 9 which closely meet the claimed composition and meet the Mo/Nb ratio.

13. Even though prior art steel contains >25% Cr whereas present invention teaches 10 to 20.45% Cr as recited by the claims, such would not be of patentable significance. Note that Grubb on lines 15 to 30 in column 6 adds Cr to increase oxidation resistance but limits the amount to no greater than 30%, and preferably no greater than 27.5% because hot workability decreases. Similarly for the same reason, applicants' specification on page 17 discloses adding 10 to 40% Cr with a preferred range of 10 to 30% to improve oxidation resistance and limits the amount to avoid deterioration of workability. Since applicants have not demonstrated (e.g. by comparative test data) that the newly claimed Cr range with an upper limit of 20.45% is somehow critical and productive of new and unexpected results, then the differences between the claims and prior art would amount to no more than routine optimization of Cr to achieve the desired balance of oxidation resistance and workability which is well within the skill of the artisan.

14. In regard to the claimed 0.1 to 2.0% Mn, note that Grubb on lines 56 to 60 in column 8 teach up to 1% with a preferred range of up to 0.5% Mn.

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15. Moreover, Grubb discloses intermetallic compound precipitation comprising Cr oxides (lines 14 to 30 in column 6), Fe precipitates (line 1-2 in column 7) and Si promoting the precipitation of laval phase (lines 33—43 in column 8). Even though prior art does not teach the Fe, Cr and Si precipitation area percentage of 0.01% or more as recited by the claims, such would be expected since composition and process limitations are met and in absence of proof to the contrary.

16. In regard to method, Grubb on lines 10-21 in column 10 discloses subjecting steel to hot rolling, annealing, pickling, and cold rolling in the same manner as applicant's method claims. Also lines 7 to 18 in column 21 disclose the additional step of precipitation hardening at 871 to 999C.

17. Grubb on lines 1-26 in column 1 uses metallic material for interconnects of solid-oxide fuel cells, and in figures 2-8 exhibit excellent heat resistance properties at 800-900C. Hence using fuel cell at operating temperature of 800C for at least 1,000 hours as recited by one or more the claims would be expected.

18. Although making fuel cell by subjecting metallic material to cutting, corrugating, etching as recited by claims 15 to 17 are not taught by prior art, such would not be a patentable difference since said process steps are conventional and well known in the art in producing fuel cell and therefore would be implicit in making prior art fuel cell.

### ***Response to Arguments***

19. Applicants' arguments filed July 12, 2007 have been fully considered but they are not persuasive.

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20. Applicants submitted that there is no description in EP'214 concerning electrical conductivity which is an important feature for fuel cell material and there is no disclosure as to the precipitation amounts of precipitates before being used as a separator of a fuel cell to thereby secure stable oxidation resistance. Hence claims 1 and 10 are different from EP'214 in terms of their objectives. Also Applicants stated there are no inventive examples in EP'214 that satisfy present invention claims 1 and 10. In particular, prior art examples 10 and 12 contain lower Mn contents and additionally contain B.

21. It is the examiner's position that similar to the present invention, EP'214 in paragraph [0058] teaches a metallic material having superior heat resistance at high temperatures and has oxidation resistance at high temperatures and can be used as materials for separators of fuel cells.

22. Moreover, EP'214 examples 1,3, 6-8 and 11 in table 1 on page 10 meet the claimed composition except for small amounts of Sc, Y, La, Ce, Pr, Nd, Pm, Sm, Zr or Hf. These elements, however, would be obvious to incorporate since they are taught as additional alloying constituents in paragraphs [0045] and [0046].

23. In regard to precipitation, prior art table 2 on page 12 discloses prior art steels containing Fe-Cr intermetallic compound precipitation, and paragraph [0024] teaches adding Si to accelerate precipitation (same reason as stated on page 16, lines 13-21 of applicant's specification).

24. Furthermore, EP'214 in paragraph [0049-0050] discloses subjecting steel to hot rolling, annealing, pickling, cold rolling and/or annealing in the same manner as claimed by applicants. In addition, paragraph [0054] further subjects steel at 900C in air for 400

hours, which would cause precipitation; and hence be equivalent to the recited aging step (note applicants age at 500-900C).

25. Since prior art closely meets the composition and process of making, then conductivity property and the mass percentage of Fe, Cr, Si precipitates at 0.01% or higher and 0.03% or higher under operating conditions would be expected in absence of proof to the contrary

26. Applicants submitted that US'780 is concern with high temperature creep resistance whereas present invention is concern with electrical conductivity and therefore have different objectives. To demonstrate the differences, Applicants stated that there are no inventive examples in US '780 that satisfy claims 1 and 10. Prior art examples in Table 1 contain Mn at 0.049 to 0.055% (outside claimed Mn range of 0.1 to 2%) and Cr at 25.52 to 25.98% (outside claimed Cr range of 10 to 20.45%).

27. It is the examiner's position that although prior art does not disclose examples that meet the claimed composition, it does broadly teach a metallic material having a composition with constituents whose wt% ranges overlap of closely approximate those recited by the claims; hence a prima facie case of obviousness is established.

28. In regard to the claimed 0.1 to 2.0% Mn, note that Grubb on lines 56 to 60 in column 8 teaches up to 1% with a preferred range of up to 0.5% Mn.

29. In regard to the newly claimed 10 to 20.45% Cr, note Grubb on lines 15 to 30 in column 6 teaches a higher Cr range >25 to 27.5%. It is the examiner's position, however, that the newly claimed 10 to 20.45%Cr fails to define patentably novelty over the prior art whose lower Cr limit is >25%, since the difference is not of any patentable



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significance; note applicants' specification on page 17 discloses adding 10 to 40% Cr with a preferred range of 10 to 30% as permissible, and there is nothing to show that an upper limit of 20.45% Cr is critical or that it involves anything more than judicious selection.

30. It is the examiner's position that since prior art composition and process of making are very similar to the present invention, then conductivity property, and the Fe, Cr and Si precipitation area percentage of 0.01% or more or 0.03% or more during operating temperature as recited by the claims would be expected in absence of proof to the contrary.

### ***Conclusion***

31. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Deborah Yee whose telephone number is 571-272-1253. The examiner can normally be reached on monday-friday 6:00am-2: 30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Deborah Yee/  
Primary Examiner  
A.U. 1742

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